

“Data Standards from A – Z”

***Proceedings of the 2001
Organization of Fish and Wildlife
Information Managers Meeting***

*November 3-7, 2001
Portland, Oregon*



Sponsored by:

The Organization of Fish and Wildlife Information Managers

Virginia Department of Game and Inland Fisheries

Conservation Management Institute, Virginia Tech

Pacific States Marine Fisheries Commission

*Lila Borge Wills, Editor
Conservation Management Institute, Virginia Tech
203 W Roanoke Street
Blacksburg, VA 24061
540 231-7348
lborge@vt.edu*

Table of Contents:

Keynote Speaker and Plenary Session	
Keynote Speaker: Tackling the Complex to Hook the Simple-Infrastructure for the Information Age <i>Meredith A. Lane, Academy of Natural Sciences</i>	9
What is a Data Standard, Why do I Need One, and Who Has One? <i>Stan Allen, PSMFC; Don Fago, WI Dept of Natural Resources</i>	11
The National Integrated Land System (NILS) <i>Leslie Cone, Bureau of Land Management</i>	15
A Strategy for Sharing Corporate Information <i>Barb White, US Fish and Wildlife Service</i>	17
The Natural Resources Information Network – An Initiative of the Southern Interior Forest Extension and Research Partnership (SIFERP) <i>Trinna Innes, SIFERP</i>	18
Concurrent Session I : Data Collection and Data Entry	
A Rosetta Stone for Fish and Wildlife Informaiton in the Pacific Northwest <i>Tom O'Neil, Northwest Habitat Institute</i>	21
Developing Species Distribution Databases Utilizing Hand-Held GPS and WWW <i>Daniel Vichitbandha,, KY Dept of Fsih and Wildlife</i>	22
Comparison of State and Federal Migratory Bird Harvest Surveys <i>Art Smith, SD Dept of Game Fish and Parks</i>	23
Transcribing and Compiling Accurate Data <i>Bob Markve, Eric Rudrud, Joe Ferrara, Dakota Data Services</i>	25
Concurrent Session II : IAFWA/NBII Planning with State Agencies – Workshop	
IAFWA/NBII Coordinator leads discussion with State Agencies <i>Jacob (Jake) Faibisch IAFWA/ NBII</i>	27
Concurrent Session I : Volunteer Datasets	
Wildlife NatureMapping <i>Karen Dvornich, University of Washington</i>	31
Cybertracking and NatureMapping <i>Dan Hannafious, Hood Canal Salmon Enhancement Group</i>	32
Online Water Data Entry and Repository for Restoration and Monitoring Sites throughout Washington State <i>Karen Dvornich, University of Washington</i>	33

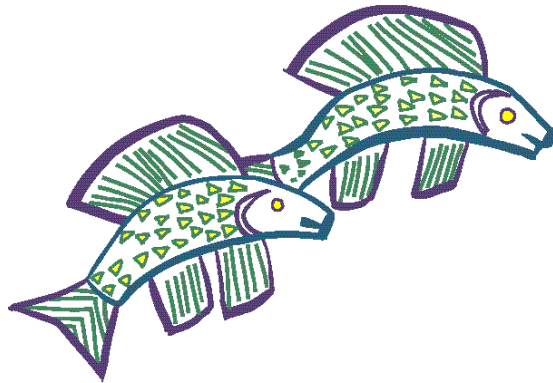
Keeping the data useable: Setting the Standards for Volunteer Data Collection <i>Jeffrey B. Trollinger, Virginia Department of Game and Inland Fisheries</i>	34
Concurrent Session II : Library / Reference	
Dublin Core-Based Metadata Standards for Resource Discovery: A USFWS Work in Progress <i>Anne Post Roy, NCTC – US Fish and Wildlife Service</i>	35
What Makes a Library a Library and Why Does it Matter? <i>Lenora Oftedahl, StreamNet Columbia River Inter-Tribal Fish Commission</i> <i>Gretta Siegel, Portland State University</i>	36
How Do you Catalog a Frog, a Matchbook Cover and Other Information-Rich Sources? <i>Lenora Oftedahl, StreamNet Columbia River Inter-Tribal Fish Commission</i> <i>Gretta Siegel, Portland State University</i>	37
WORKSHOP	
Concurrent Session I : Data Management and Delivery	
The Chesapeake Information Management System (CIMS: Using a Distributed Data System to Manage Environmental Data Across Political Boundaries <i>Bridgett Hagerty, Chesapeake Research Consortium</i>	41
West Coast Electronic Fish Ticket and Logbook System <i>Carol Murray, National Marine Fisheries Service</i>	42
The Development and Implementation of a Database and GIS Application for Anadromous Fish and Impediment Information or ...Go Fish Go! <i>Shelly Miller and Karen Reay, VA Dept of Game and Inland Fisheries</i>	44
Hydrography Framework Clearinghouse for the Pacific NW <i>Dale Guenther, Regional Ecosystem Office, US Forest Service</i>	45
Data, Standards, and The Scientific Collection Permit Process in Virginia <i>Kathleen Quindlen and Amy Martin, VA Dept of Game and Inland Fisheries</i>	47
Applying a Consistent Definition to the Development of Statewide Salmonid Distribution Data <i>Jon Bowers, OR Dept of Fish and Wildlife</i>	49
Scrambling for Data Standards in Habitat Restoration Projects <i>Dick O'Connor, WA Dept of Fish and Wildlife</i>	51
Content Syndication Between State and Federal Fish and Wildlife Agency Web Sites: A Proposal on the Use of XML Resources <i>Kirk Keller, MO Dept of Conservation</i>	53
Concurrent Session II : Metadata Training Workshop	
Metadata Training Session - WORKSHOP <i>Sharon Shin, US Geological Survey/Biological Resources Division</i> <i>Bruce Westcott, SMMS Metadata Consultant</i>	54

<p>Banquet Speaker: National Biological Information Infrastructure (NBII): History, Goals, Structure, Direction, Applications <i>John “Jack” M. Hill, Ph.D., VP; NBII Coalition Chairman, Houston Advanced Research Center (HARC)</i></p>	55
<p>Closing Session : Data Management and Delivery</p>	
<p>NBII Activities: Biological Data Profile and NBII Thematic and Regional Node Activities <i>Sharon Shin, US Geological Survey/Biological Resources Division</i></p>	59
<p>Use of Regionwide Data Exchange Formats to Organize Dissimilar Data <i>Bruce Schmidt, StreamNet Pacific States Marine Fisheries Commission</i></p>	60
<p>Long Term Fisheries Monitoring Using Standardized Data Sets: How Well is it Working? <i>Michael Banach, StreamNet Pacific States Marine Fisheries Commission</i></p>	61
<p>Obstacles to Standardization of Field Sampling Methodology, OR, Why is it So Hard to Get Everyone to Do it the Same Way? <i>Bruce Schmidt, StreamNet Pacific States Marine Fisheries Commission</i></p>	62
<p>Establishing and Implementing Aquatic Standards in the U.S. Forest Service: Protocols, Attributes, Hydrography and Applications <i>Shaun P. McKinney, US Forest Service</i></p>	63
<p>POSTER Session</p>	
<p>The Columbia Basin PIT Tag Information Systems A Real-life, Real-time, Regional Fisheries Research and Monitoring Success Story <i>Carter Stein, PTAGIS Program Manager and Dave Marvin, PTAGIS Systems Analyst*</i></p>	67
<p>Development and analysis of an electronic response system for harvest surveys <i>Art Smith, and Larry Gigliotti, SD Department of Game, Fish & Parks</i></p>	68
<p>Transcribing and Compiling Accurate Data <i>Bob Markve, Eric Rudrud, Joe Ferrara, Dakota Data Services</i></p>	69
<p>California Habitat Restoration Project Database <i>Robin Carlson and Stan Allen, Pacific States Marine Fisheries Commission</i></p>	70
<p>Access to Bird Population Data through Web Mapping <i>Elizabeth Martín, U.S. Geological Survey; Bruce G. Peterjohn U.S. Geological Survey, Mark D. Koneff, U.S. Fish and Wildlife Service</i></p>	71
<p>Setting standards for the “do’s and don’ts” of software interface design <i>Kevin L. Sallee, Ecological Software Solutions</i></p>	72
<p>The Natural Resources Information Network – An Initiative of the Southern Interior Forest Extension and Research Partnership (SIFERP) <i>Trinna Innes, SIFERP</i></p>	73
<p>Moving Data through the Kentucky Fish and Wildlife Information System (KFWIS) Model <i>Daniel Vichitbandha, KY Dept. of Fish and Wildlife Resources</i></p>	74

Plenary Session:

~ Keynote Address ~

*Meredith Lane
Sr. Vice President, Science
Vice President, Biodiversity Research Group
Academy of Natural Sciences
Philadelphia, PA*



Opening Speakers

*Stan Allen, Pacific States Marine Fisheries Commission
Don Fago, Wisconsin Department of Natural Resources*

Leslie Cone, Bureau of Land Management

Barb White, US Fish and Wildlife Service

Trinna Innes, Southern Interior Forest Extension and Research Partnership

Keynote Address

Tackling the Complex to Hook the Simple: Infrastructure for the Information Age

Meredith A. Lane

Sr. Vice President, Science
Vice President, Biodiversity Research Group
Academy of Natural Sciences
1900 Benjamin Franklin Parkway
Philadelphia PA 19103
215.405.5060
lane@ansp.org

Standards make life simpler, once they are adopted and in place. And, sometimes, figuring out what the standard should be is an easy matter, based on long historical tradition. The width of narrow-gauge railroad tracks is the same as distance between the ruts in unpaved roads at the time railroad was invented, which was the same as the width of Roman roads in Britain, which in turn was determined by the amount of space needed to accommodate two horses side-by-side between the traces of the Legions' supply wagons. However, as we move from the physical world into the ethereal world of digital information, pre-invented standards are not always at hand. Different fields of endeavor are tackling similar problems in different ways, inherently inventing standards that work within a single discipline but which are in conflict if information is sought across disciplines. Fish and wildlife managers, taxonomists and conservation biologists all have needs for biodiversity, ecological and ecosystem information. All are building databases, most in sufficiently sophisticated manner that standards are being applied—but—we all love standards so much that we each want our own. The efforts of all the disciplines will become beneficial to all the others if we can build a common infrastructure that is flexible enough to accommodate the disparate needs of users. To do this well, it must be coordinated globally, which is why the Global Biodiversity Information Facility has been established.

Tackling the Complex to Hook the Simple: Infrastructure for the Information Age

Biography for Meredith Lane:

Meredith Lane is currently the Senior Vice President for the Biodiversity Research Group at the Academy of Natural Sciences in Philadelphia. Before coming to the Academy, she was Curator-in-Charge of the Division of Botany of the University of Kansas Natural History Museum, as well as Professor of Ecology and Evolutionary Biology in KU's Plant Biology Program, from 1989 to 1999. Earlier, she served on the faculty of the University of Colorado in Boulder (1980 – 1989), and as a visiting professor at the University of Texas (summer 1982) and the University of Wyoming (1985-1986), where she was also Acting Curator of the Rocky Mountain Herbarium.

*On leave from KU from 1995 to early 1998, Lane served for two years as a Program Director in the Division of Biological Sciences of the National Science Foundation, where she managed two programs, one concerned with the discovery of biodiversity and the other with stewardship of natural history collections. Following that appointment, she was an Agency Representative from the National Science Foundation to the Environment Division of the Office of Science and Technology Policy at the White House. There, she was Study Executive Director for the Biodiversity and Ecosystems Panel of the President's Committee of Advisors on Science and Technology. That panel produced *Teaming with Life: Investing in Science to Understand and Use America's Living Capital* in 1998; it contains significant sections on collections and collecting, as well as environmental education and the need for digitized specimen data.*

*During her time at NSF and OSTP, and subsequently, Lane has worked to promote the development of the National Biological Information Infrastructure, as well as the Global Biodiversity Information Facility. She encourages the open sharing of biodiversity information in support of environmental and biodiversity protection and conservation, and to that end is working with the Academy's curators in seeking funding and personnel to digitize all of the Academy's collections, as well as significant portions of the Library. Other of her major interests are the promotion of cooperative action among natural history institutions to enhance public understanding of the importance of collections to society (see <http://www.mobot.org/mobot/research/Rolenathistcol.html>) and the care and feeding of orphaned collections and the institutions that adopt them (see *Museum News*, January/February 2001, pp. 60–63, 83). She is currently serving as President of the Natural Science Collections Alliance, an organization that advocates for funding for collections and the institutions that preserve them and make their data available digitally.*

What is a Data Standard, Why do I Need One, and Who Has One?

Stan Allen

Pacific States Marine Fisheries Commission
45 S.E. 82nd Drive, Suite 100
Gladstone, OR 97027-2522
(503) 650-5400 phone
(503) 650-5426 fax
stan_allen@psmfc.org

Don Fago

Wisconsin Dept. of Natural Resources - Research Center
1350 Femrite Dr.
Monona, WI 53716
(608) 221-6366 phone
(608) 221-6353 fax
Fagod@dnr.state.wi.us

The Data Process

There are multiple steps in the “data process.” Some of the following steps (*italicized*) lend themselves to the topic of standardization easier than others. In a broad sense, we see the steps in the data process as including:

- Initial questions, policy, plan, goals and objectives, end product, etc., are defined.
- Identification of data needs.
- *Data collection.*
- *Data entry and compilation.*
- *Data management.*
- *Data delivery.*
- Data use and analysis.

What is a Data Standard?

As mentioned, there is not a real clear picture or definition of what a “data standard” is. It appears that we all say the words, but when asked what they mean we have a hard time describing it. In searching for “data standard” on the web site www.dictionary.com, which draws on information from all dictionary sources, no definition was found for “data standard”.

Data was defined as a Latin word which is the plural of datum, with the following definitions used:

1. Factual information, especially information organized for analysis or used to reason or make decisions.

2. Computer Science. Numerical or other information represented in a form suitable for processing by computer.
3. Values derived from scientific experiments.
4. Plural of datum.

Standard was defined as a middle English word (from Old French *estandard*, rallying place, probably from Frankish *standhard* : *standan, to stand.), with the following definitions used:

1. Serving as or conforming to a standard of measurement or value.
2. Widely recognized or employed as a model of authority or excellence: a standard reference work.
3. Acceptable but of less than top quality: a standard grade of beef.
4. Normal, familiar, or usual: the standard excuse.
5. Commonly used or supplied: standard car equipment.
6. Linguistics. Conforming to established educated usage in speech or writing.

Source: The American Heritage® Dictionary of the English Language, Fourth Edition, Copyright © 2000 by Houghton Mifflin Company. Published by Houghton Mifflin Company. All rights reserved.

So, what do fish and wildlife information managers mean when we say “data standard”? This year the OFWIM meeting will be focused on presentations with data standards as the focal point. We hope better definitions can be developed and shared with you based on these discussions.

Why do you Need Data Standards?

Why do you need data standards? This is an easy question to answer. You don't. You don't, unless you want to use your data, share your data, combine your data with other data, etc. Even if we cannot get a good grasp on a common definition of what a data standard is, we all create and use them, often not even realizing that we are.

For instance, when a biologist decides to collect data to answer a question, they select a method, protocols, equipment and data forms they will use to collect the data. By doing so – the biologist has immediately established a set of data collection standards for their individual effort. The biologist probably does not look at it this way, but they have established standards. If the biologist in the next drainage (region, state, country) over is not aware their fellow biologist has established these standards, and follows them, they will establish their own set of data collection standards and collect the data, most often in a different way. The two data sets in this hypothetical (although very real) example are most likely incompatible and will not be of much use in broader applications.

Similar scenarios to the above example occur with choices we make in data management, software, data delivery, and data documentation (i.e. metadata).

Who has Data Standards?

As part of the preparation for the OFWIM 2001 meeting, an on-line data standards survey was conducted. One of the primary purposes for conducting this survey was to determine who has “data standards.”

As of 22 August, 2001, 32 surveys have been completed from nine states agencies, three federal agencies, one Canadian provincial agency, and one Canadian university. The number of Subject Areas per survey varied from 1 to 14 with an average of 3.5. The two most common Subject Areas of all those responding were "Fishery Surveys" with 14 and "Spatial" with 11. The least common were "Other" and "No Standards" with zero. The Entry/Information was the most common type of standard used for the Subject Areas, which was used by 26 of the 32 databases. The next most commonly used type of standard was Collection with 24, Management with 21, Software with 16, Delivery with 15, Metadata with 14, and Reference/Library with five. The Federal, National or International Standards used in creating these various types of standards (collection, entry, management etc.) averaged 29% for FDGS (Federal Geographic Data Committee), 18% for ITIS (International Taxonomic Information), 31% for HUC (Hydrologic Unit Code), 24% for FIPS (Federal Information Processing Standards), 43% for their state standard, 8% for no standards used, and 32% for other standards. More than one of these standards were used by those developing their standards for each type of standard (collection, entry, management etc.).

There was some confusion by those completing the survey in several sections of the survey. One was on the definition of a standard and in particular what are Management Standards, and Reference/Library Standards. Another difficulty pertained to the Standards Distribution portion of the survey. The "None" response for distribution within and outside of the agency/organization was especially difficult. There was also a problem with the Internet path for their standards not pointing to the exact web page that contained their standards.

With the knowledge gained on data standards from this conference, it is hoped that it would be much easier for all of us to complete a revised survey in the future.

Biographies:

Stan Allen is currently a Program Manager for the Pacific States Marine Fisheries Commission helping California and the Northwest establish and continue cooperative data programs. Stan has been a part of fish and wildlife data and information management for over 18 years now. The past 9 years of which has been working with the Commission on multi-state/coastwide data programs. Before his current work with the Commission, he worked for the Idaho Department of Fish and Game where he was responsible for and involved in state/regional and national level data efforts. Stan has been involved with OFWIM since its inception and is the current President-Elect, in addition to hosting this years meeting.

Don Fago is currently a Fishery Scientist-Advanced for the Bureau of Integrated Science Services of the Wisconsin Department of Natural Resources. Don has been doing fishery research with the WDNR for over 31 years. Much of this time has been devoted to database design and management. In addition, he has conducted projects on the distribution of fish species in Wisconsin, on the movement of channel catfish and walleye using radio telemetry, on the creation of a waterbody identification system for the streams and lakes in Wisconsin, and on the assignment of waterbody codes (WBIC) to our state's 24k hydro layer. Don has been a OFWIM member for the last four years and presently chairs the Data Standards Committee and the Mideast Regional contact.

The National Integrated Land System (NILS)

Leslie M. Cone

Project Manager L&RP

US Department of the Interior BUREAU OF LAND MANAGEMENT

Land & Resources Projects Office Denver Federal Center, Building 40

P.O.Box 25047

Denver, Colorado 80225-0047

(303)236-0815

leslie cone@blm.gov

The National Integrated Land System (NILS), is a joint project between the Bureau of Land Management (BLM) and the USDA Forest Service. Partnering with states, counties, municipalities and private industry, the goal of NILS is to develop a common data model and software tools for collecting, managing, and sharing survey data, cadastral data, and land records information. Using GIS technology, NILS aims to facilitate land management and improve decision-making by land managers.

The GeoCommunicator, the initial module of NILS, is near deployment. Powered by the Geography Network, it represents a proactive Internet subscription website (a land-based search engine) for sharing information and activities of interest to land managers. It is currently entering the user-testing phase prior to its release.

Additional NILS modules include Survey Management (SM), Measurement Management (MM), and Parcel Management (PM). Survey Management comprises a set of automated survey field data collection software which will function with existing commercial surveying equipment and software packages. It will capture field measurements and metadata directly into a GIS database format. The goal is to minimize the need for data conversion due to software incompatibilities as survey measurements and data become incorporated into the land records management system.

Measurement Management is a set of mathematical models, functionalities, and GIS software tools designed specifically for cadastral surveyors. It will provide the processes for performing calculations on field survey data - creating, editing and manipulating basic survey features, balancing and adjusting surveys, subdividing parcels, and associating land description data with the surface expressions of land. The goal of Measurement Management is to provide a process that enables users to create a higher quality control network database for both the Public Land Survey System (PLSS), as well as metes and bounds land environments.

Parcel Management will provide a process for managing land records and cadastral data stored in the database model. It will include custom software tools and procedures for maintaining land parcels in a transactional, history tracking environment. Parcels will be constructed from existing or new legal descriptions of surveyed or unsurveyed lands to form integrated parcel networks (fabrics), based on a particular business practice or need. For example, ownership or planning areas in a user-defined geographic area. Users will be able to customize the parcel maintenance process to accommodate their present workflow and business procedures.

Biography:

Leslie Cone is the Project Manager for a Bureau of Land Management (BLM) and U.S. Forest Service joint development project entitled the National Integrated Land System (NILS). The goal of this project is to provide integrated spatial data across the landscape in order to support ecosystem-level resource planning and management through the development of a common data solution and tool sets for managing cadastral and land record (parcel) data. This project is being developed in partnership with ESRI, counties and states and by providing a common data solution and tool sets will support decision making at all levels and provide better access to the country's land records.

Prior to managing NILS, Leslie managed BLM's Legacy Rehost Project (LR 2000) Y2K project and BLM's Automated Land and Mineral Record System's (ALMRS) Release 2. ALMRS was a project to automate BLM's land and mineral records and was managed out of BLM's National Information Resources Management Center (NIRMC) in Denver, Colorado.

Before joining the NIRMC, Leslie was the Roswell District Manager (1992-1996), where she was responsible for overseeing the resource management of a nine-county district which includes 4 million acres of public lands and another 10 million acres of mineral estate. Leslie has been with the BLM for 25.5 years and has held a variety of positions, including Area Manager, Indio (1983-88), Resource Area and Project Manager, NBEI Team (1979-83), and Communications Coordinator, ALMRS Project (1989-91). Ms. Cone completed the Department of the Interior's Management Development Training Program in 1989 and the Senior Executive Service Candidate Development Program in 1999.

Ms. Cone holds a Bachelor of Science degree in Forestry and Outdoor Recreation from Colorado State University and a Masters degree in Public Administration from the University of New Mexico.

A Strategy for Sharing Corporate Information

Barb White

U.S. Fish and Wildlife Service
Division of Information Resources Management
Branch of Data and Systems Services
P.O. Box 25207 Denver Federal Center
Denver, CO 80225-0207
303-275-2310
barb_white@fws.gov

On August 27, 1999, the Deputy Director of the U.S. Fish and Wildlife Service signed "A Strategy for Sharing Corporate Information. This document describes a progressive strategy of change that will enable the Service to begin sharing its data as a corporate asset and, thereby, more efficiently accomplish its mission and enhance its ability to respond to future demands for information. Two of the six initiatives identified for successful implementation of the strategy include development of official standards for common data elements and a "master table" that contains core information on Service organizations.

This presentation will focus on the Services data administration program, which includes the establishment of an official data standards process, designation of data stewards, development and implementation of data standards in a variety of categories, and the integration of these standards and organizational data in a Corporate Master Table (CMT) System that is accessible to all Service users via the Intranet. The CMT is a web-based system that allows Service personnel to utilize a corporate data set of known quality in other automated systems and applications, thereby eliminating the workload required to maintain each system's data set and facilitating data sharing.

Biography:

Seventeen of my 22 years of Government service have been spent in the U.S. Fish and Wildlife Service. My current position is Data Specialist with the Branch of Data and Systems Services, Division of Information Resources Management. The Branch is located in Lakewood, CO, but is administered by, and reports to, the Division office in Washington, D.C. My primary duties include defining, developing, and administering data standards for Service-wide implementation; reviewing and developing policy and guidance on issues that pertain to Service data and information systems; and serving as System Administrator for the Service's Corporate Master Table (CMT) System, a web-based system that contains a core set of administrative data on Service organizations that is accessible to every Service employee.

During the period of 1983 through 1998, I served as the GIS and Remote Sensing Project Leader at the Midcontinent Ecological Science Center (MESC) in Fort Collins, CO. The five-year period between 1993 and 1998 was spent as an employee of the National Biological Service created by Secretary Bruce Babbitt and, ultimately, the U.S. Geological Survey's Biological Resources Division. For 15 years, I managed and coordinated the GIS production and mapping support for the MESC and its clients. This included remote sensing, photo interpretation, manual transfer and drafting, digitizing, database construction and management, and geospatial metadata development.

In addition to my project leader responsibilities at the MESC, I served as the Contracting Officer's Technical Representative (COTR) on the technical support services contract, which ultimately provided contractor services not only to the MESC, but five other research centers across the country. The five-year contract provided on-site and off-site contractor support services in several areas, including GIS, mapping, remote sensing, biological data collection and analysis, technical illustration and graphics production, technical writing/editing, database management, computer programming, and systems analysis.

The Natural Resources Information Network

An Initiative of the Southern Interior Forest Extension and Research Partnership (SIFERP) and British Columbia's Natural Resource Communities

Trinna Innes

Natural Resources Information Specialist
Southern Interior Forest Extension & Research Partnership
478 St. Paul Street
Kamloops, BC, Canada V2C 2J6
250-371-3955
trina.innes@siferp.org

The Southern Interior Forest Extension and Research Partnership (SIFERP), is a unique, non-profit society with over 40 member organizations. We are dedicated to promoting - through extension and research - healthy and sustainable ecosystems throughout the interior of British Columbia, Canada.

In consultation with a wide variety of organizations and consulting support from private industry, SIFERP is facilitating the development of the Natural Resources Information Network (NRIN).¹ The vision for NRIN is:

To be a provincially-recognized network of organizations that cooperate to provide a comprehensive online source of information on natural resources and their management in support of effective planning, research and management decision-making in British Columbia.

NRIN provides the people of British Columbia a comprehensive searchable database of provincial organizations, events, publications (documents and data sets) and bulletins relating to natural resources and their management.

Via an oral presentation or poster submission, SIFERP would be pleased to explain how NRIN links many disparate information sources together for common search and discovery. We would outline how the FGDC metadata standard is used in our master catalogue and on online data entry tool. We would also present how SIFERP delivers extension services to assist each participating organization in making local decisions about suitable metadata frameworks (e.g., FGDC, GILS and Dublin Core) and discuss how that information is linked to NRIN—a true “one-stop-shop”.

Biography:

Trinna Innes is an information management extension specialist with the Southern Interior Forest Extension and Research Partnership (<http://www.siferp.org>), in Kamloops, British Columbia. Formerly a registered professional forester with the BC Ministry of Forests, Ms. Innes has over ten years of experience working in New Brunswick, Ontario, and British Columbia in the areas of: land-use planning, community watershed management, biodiversity, forest inventory, environmental impact assessment and spatial theory. For the past few years, she has turned her interests towards improving the access and exchange of natural resource information in British Columbia by facilitating the development of the Natural Resources Information Network. Ms. Innes has completed undergraduate and graduate degrees in natural resource management (BScH [1989], University of Western Ontario; MF [1991], University of New Brunswick), and is an MBA candidate at Athabasca University. Her interests include the management of knowledge, projects and information technology.

¹ Additional information on NRIN may be obtained at: <http://www.siferp.org/nrin>

Concurrent Sessions:

Data Collection and Data Entry

Tom O'Neil, Northwest Habitat Institute

Daniel Vichitbandha, KY Department of Fisheries and Wildlife Resources

Art Smith, SD Department of Game, Fish and Parks

Bob Markve, Black Hills Special Services Cooperative

Eric Rudrud, St. Cloud State University

Joe Ferrara, Minot State University



Planning with State Agencies (Workshop)

*Jake Faibisch, International Association of Fish and Wildlife Agencies in association
with the National Biological Information Infrastructure*

Two hour planning meeting with State Agency and OFWIM Participants

A Rosetta Stone for Fish and Wildlife Information in the Pacific Northwest

Thomas A. O'Neil*

Northwest Habitat Institute
Corvallis, OR 97339
(541) 929-6330 habitat@nwhi.org

David H. Johnson

Eva Wilder
Washington Dept. of Fish and Wildlife
600 Capitol Way North
Olympia, WA 98501-1091

Peter Paquet

Northwest Power Planning Council
851 SW Sixth, Suite 1100
Portland, OR 97204-1348

Paul Whitney

Beak Consultants
317 S.W. Alder, Suite 900
Portland, Oregon 97204

Bruce Marcot

USDA Forest Service, Research Wildlife Ecologist
Pacific Northwest Research Station
1221 S.W. Yamhill St.
Portland OR 97208-3890

A common lexicon for fish and wildlife is needed; if we are ever want to achieve consistency in our inventorying and monitoring of our natural resources. Agreeing to common definitions for words and protocols that are used to describe fish, wildlife and their habitats allows multi-disciplinary researchers and managers to interact and build a common understanding for management. Over the past 5 years, we have been involved in number of projects where we have strived to achieve common terminology, and our talk reports on those attempts. Specific, projects reported on are: Wildlife-Habitat Relationships in Oregon and Washington that defined over 300 terms; Monitoring Salmon Habitat in the Pacific Northwest that examined over 100 protocols; and A Multi-species Framework Approach for the Columbia River Basin that examined integrating fish, wildlife, and ecological functions. Our presentation will highlight the need for collaboration of common fish and wildlife vocabulary so that inter and intra-disciplinary approaches can effectively communicate across scientific, organizational or political borders.

Biography:

Tom O'Neil has spent 25 years working on ecological issues in the Pacific Northwest and has several degrees from the University of Montana and the University of Toledo. Currently, Tom is the Director of the Northwest Habitat Institute. Previously, he has worked as a Wildlife Ecologist for Oregon Department of Fish and Wildlife (ODFW), Research Division; the University of Chicago's Argonne National Laboratory; Montana Power; and USDA Forest Service. Tom has co-authored the books: Wildlife-Habitat Relationships in Oregon and Washington and the Atlas of Oregon Wildlife. Data development wise, Tom was the originator of the Oregon Species Information System for the ODFW and currently a co-developer of the Interactive Biodiversity Information System (IBIS).

Developing Species Distribution Database Utilizing Hand-Held GPS and WWW

P. Daniel Vichitbandha

Wildlife Division

Dept. of Fish and Wildlife Resources

#1 Game Farm Road

Frankfort, KY 40601

(502) 564-7109 ext. 476

Daniel.Vichitbandha@mail.state.ky.us

The Kentucky Fish and Wildlife Information System (KFWIS) database provides storage and access to information on distribution of species in Kentucky. Data sources for distribution are highly variable in terms of quality and accuracy. This paper presentation describes a process of data collection and data entry to the KFWIS database. Species observations are routinely collected during daily activities by the Kentucky Dept. of Fish and Wildlife Resources (KDFWR) biologists using hand-held Global Positioning System (GPS) to locate the observation. Data are entered by biologists via World Wide Web into KFWIS database that is in SQL Server. Information on species distribution is then available for query using the World Wide Web.

Biography:

Daniel Vichitbandha is a graduated of Murray State University, Kentucky in Master of Geography emphasizes in Remote Sensing and Geographic Information System. His professional experiences are included GRASS (Geographic Resources Analysis Support System) Coordinator at the US Army Construction Engineering Research Laboratory and GIS programmer at Ogden INC. Currently, he is the GIS Specialist/Database Manager at the Kentucky Fish and Wildlife Resources.

Comparison of State and Federal Migratory Bird Harvest Surveys

Art Smith*

Game Harvest Surveys Coordinator
Department of Game, Fish & Parks
523 E. Capitol Ave
Pierre, SD 57501
(605) 773-4195
Arthur.Smith@state.sd.us

Steve Cordts

Assistant Waterfowl Program Leader
Texas Parks and Wildlife
4200 Smith School Road
Austin, TX 78744
(512) 389-4766
Steve.Cordts@tpwd.state.tx.us

Paul Padding

Chief, Survey Operations
USFWS Waterfowl Harvest Surveys Section
10815 Loblolly Pine Dr., Rt. 197 gate 4, Bldg. 158
Laurel, MD 20708
(301) 497.5982
Paul_Padding@fws.gov

Harvest of migratory birds requires complex coordination and agreements between multiple federal, provincial, and state agencies. These associations are required because of the large areas covered by birds during their migratory routes. To assist in preventing over-harvest of any one species, the US Fish and Wildlife Service developed the Harvest Information Program (HIP) to help estimate species-specific harvest levels. HIP estimates, combined with other biological information, help monitor the status of harvested bird populations, protecting the birds for future generations to enjoy. Unfortunately, past attempts to compare state-derived harvest estimates to HIP estimates have met with disturbingly varied results.

This paper will explain why some state estimates do not match well with HIP numbers. By breaking down harvest survey procedures, we describe potential techniques which can be used for each of the parts, and discuss their potential strengths and weaknesses. To illustrate some of the hurdles faced when calculating state-derived migratory bird harvest estimates, we focus our analysis on 2 states, Texas and South Dakota, which lay near the extremes of the migratory bird ranges in the United States portion of the Central Flyway.

Biographies:

Art Smith received his BS in ecology and systematic biology from Cal Poly, San Luis Obispo, CA and his MS in wildlife ecology from the Department of Wildlife Ecology, University of Wisconsin, Madison. Art has worked for several federal, state, and private natural resource agencies as a consultant. He is a Certified Wildlife Biologist, and has been employed by the South Dakota Game, Fish and Parks as the Game Harvest Surveys Coordinator since 01/01/01 and is the OFWIM Midwest regional contact.

***Steve Cordts** is the Asst. Waterfowl Program leader for Texas Parks and Wildlife Department in Austin, TX. He also coordinates the Harvest Information Program for the state. He received his M.S. degree in Wildlife Ecology from Iowa State University where his thesis research examined estimation of waterfowl breeding pair abundance and survey methods in the Prairie Pothole Region of northern Iowa. His interests include waterfowl population ecology and harvest surveys.*

***Paul Padding** joined the U.S. Fish and Wildlife Service's Division of Migratory Bird Management in 1991, and completed a PhD in wildlife biology from Michigan State University the following year. He currently serves as chief of the Division's Harvest Surveys Section, which conducts the national migratory bird Harvest Information Program harvest surveys annually.*

Transcribing and Compiling Accurate Data

Bob Markve

Black Hills Special Services Coop.
P.O. Box 218
Sturgis, SD 57885
(605) 347-4467

Eric Rudrud

Dept. of Leadership
St. Cloud State University
720 Fourth Ave So
St. Cloud, MN 56301
(320) 255-4155

Joe Ferrara

NDCPD
Minot State University
500 University Ave W
Minot, ND 58701
(800) 233-1737

Collecting, transcribing, and entering field and survey data is a time consuming task, often completed on an irregular or as needed basis. Major obstacles associated with data entry and compilation include:

- the accuracy of data entry is often unknown or suspect
- data often sits collecting dust, rather than be used
- the time crunch to enter data interferes with day to day operations
- data may be compiled in formats that are not user friendly

Dakota Data Services is a non-profit agency provides data transcription services to businesses and agencies. Transcription services include text and numeric data entry, data tabulation and formatting, exporting of data files, statistical analysis, and data presentation.

Dakota Data Services utilizes adaptive computer software that allows individuals with disabilities to enter data from remote locations, i.e. Hot Springs and Sturgis, S.D. Individuals dual enter survey data (two different individuals enter each survey or data form). Computer software checks for accuracy of data entry. If two individual data records agree, the data is entered. If there is a disagreement, the data record goes to quality control for final entry. All data is then uploaded and stored on a secure server. Data is then entered in either Access data-base, Excel Spreadsheet, and/or other data base format. Data can be compiled with a statistical analysis and/or formatted for presentation as charts, graphs, and/or text.

Businesses access their data via a secure web site where the business logs in and downloads data or Dakota Data sends the data file to the business via email. Dakota Data Services provides accurate data transcription services at competitive prices, fast turn around time, secure Internet connectivity for your data, and confidentiality.

Customers include: Amoco Television Network, RedHouse Records, Brutger Enterprises, Square D Corporation, Central Minnesota Workforce Center, S.D. Governor's Council on Developmental Disabilities, and North Dakota Governor's Office.

Biographies:

Dr. Joe Ferrara is the Associate Director of Development at the North Dakota Center for Persons With Disabilities at Minot State University, Minot, North Dakota. Dr. Ferrara has extensive experience in artificial intelligence applications, program evaluation, computer networks, and adaptive computer programming. Dr. Ferrara was project director of TRANS:TECH which produced the adaptive computer software for data entry and analysis.

Dr. Eric Rudrud is a Professor in Community Psychology at St. Cloud State University, St. Cloud, Minnesota. Dr. Eric Rudrud has experience in program evaluation and community integration of persons with severe disabilities. Dr. Rudrud has designed and implemented numerous program evaluations for the Minnesota Governor's Planning Council on Developmental Disabilities, South Dakota Planning Council on Developmental Disabilities, Minnesota Workforce Center, St. Cloud Housing and Redevelopment Authority, and other private, state, and public agencies.

Bob Markve is the Director of Vocational Services at the Black Hills Special Services Cooperative, Sturgis, S.D. Mr. Markve is developed innovative community based vocational services for individuals with disabilities. Mr. Markve has worked with the TRANS-TECH project at Minot State University and is the principal investigator for the Dakota Data Services project. Mr. Markve has made significant contributions in the field of vocational education and rehabilitation services in expanding the diversity of employment options for persons with disabilities.

Planning with State Agencies Workshop

Jake Faibisch

IAFWA / NBII Coordinator

International Association of Fish and Wildlife Agencies

444 N Capitol Street, NW Suite 544

Washington, DC 20001

(202) 624-7744

NBII Agenda for the OFWIM meeting

NBII / IAFWA relationship outline

- Cooperative Agreement overview
- Implementation process for the Coop. Agreement

NBII Overview

- NBII philosophy, description, and goals
- Node structure

Brainstorming Session (Input)

- Ask a series of questions to get initial input useful in shaping the Focus Group process
 - What can states hope to get from NBII participation?
 - What are states willing to contribute?
 - How could states benefit from sharing data?
 - More questions.

Focus Group Process Overview (Input)

- Outline the planned focus group meetings
- Get input from the group on what information they would like form the focus groups.
- Establish a planning group core that includes OFWIM members (Action)

Biography:

Jacob (Jake) Faibisch currently serves as the NBII Coordinator for the International Association of Fish and Wildlife Agencies. He holds a Bachelor of Science in wildlife and fisheries biology from the University of Vermont, and he is certified as an Associate Wildlife Biologist from The Wildlife Society. Before coming to IAFWA, Jake created the Recreational Boating and Fishing Foundation Educational Web Directory, a large, database driven website and other conservation oriented websites as an independent contractor. Jake was an I&E Manager for the Utah Division of Wildlife Resources from 1995-1999, and he served as a natural resources educator for the New York Department of Environmental Conservation and the Vermont Fish and Wildlife Department. Jake has also worked on wild turkey telemetry in Arkansas, and he served as a wildlife biologist for the Peace Corps in the Republic of Congo working on forest ungulate surveys.

Planning with State Agencies Workshop (continued)

Jake Faibisch

IAFWA / NBII Coordinator

International Association of Fish and Wildlife Agencies

Background Information on IAFWA / NBII Relationship and Coordination:

The OFWIM session for NBII will be the first of three planning meetings as required by the cooperative agreement between IAFWA and the USGS.

Focus groups (at least 2):

Primary data gathering for planning process. Ask how each states in each group can benefit from the NBII, and how they feel they could contribute data. There are likely to be three focus groups in all.

Planning meetings (at least 3):

Use focus group information to shape the IAFWA / NBII plan. Set goals and outline implementation strategies.

Meeting 1

OFWIM annual meeting – Introduce the NBII and seek input from OFWIM members on the states' needs. Get initial input on what OFWIM members would like from the focus groups.

Meeting 2

Follows final focus group. Analyze focus group information to outline the IAFWA / NBII plan. Focus on strategic issues such as goals, politics, and needs the project will serve.

Meeting 3

Finalize Plan outline. Focus on operational issues such as financial needs, who should do the work, how the states will cooperate to pull off the plan.

Concurrent Sessions:

Volunteer Datasets

Karen Dvornich, University of Washington

Dan Hannafious, Hood Canal Salmon Enhancement Group

Karen Dvornich, University of Washington

Jeffrey Trollinger, VA Department of Game and Inland Fisheries



Library and Reference

Anne Post Roy, US Fish and Wildlife Service

Lenora Oftedahl, StreamNet Columbia River Inter-Tribal Fish Commission

Gretta Siegel, Portland State University

Wildlife NatureMapping Data Reporting Standards

Karen Dvornich,
National Director, The *NatureMapping* Program
University of Washington
Washington Cooperative Fish and Wildlife Unit
Box 355020, Seattle, WA 98195-5020
(206) 616-2031
vicon@u.Washington.edu

The *NatureMapping* Program in Washington State has collected over 170,000 wildlife observations since its inception in 1993 from schools, individuals, community groups and professionals. Washington Gap Analysis predicted range distribution maps are used as the base for which public and research data are overlaid to assess the models and populate the statewide database with observations unattainable by researchers, (e.g., peoples' own property). This presentation will demonstrate how standards are set for volunteer collected data and how reliable they are when compared to GAP models.

Biography:

Karen Dvornich is The NatureMapping Program co-founder, National Director, outreach coordinator of the Washington Cooperative Fish and Wildlife Research Unit, and former Washington Gap Analysis Project Assistant. Karen has B.S. degrees in Ethology and Zoology and 20 years of experience in information technology and telecommunications.

CyberTracking and *NatureMapping*

Dan Hannafious

NatureMapping Program Assistant
Hood Canal Salmon Enhancement Group
PO Box 1445, Belfair, WA 98528
(360) 275-0721
hcwater@hctc.com

CyberTracker is a comprehensive field data collection and ecology awareness training program that uses handheld computer, GPS and GIS mapping software technologies to collect wildlife and habitat data. Users can easily enter data rapidly without sacrificing quality or detailed information. CyberTracker World and The *NatureMapping* Program have partnered to develop a *NatureMapping* sequence for schools and the general public. The process for developing this field data collection program will be described using examples from professional trackers, and high school students working with biologists. In addition, predicted impacts on data standardization and reliability will be explained.

Biography:

Dan Hannafious is the Assistant Coordinator for the NatureMapping Program. He has lived in Washington, Oregon, and Alaska and has been associated with the program for the last six years. He has a B.S. degree in Wildlife Science from Oregon State University. He is currently working for the Hood Canal Salmon Enhancement Group in Belfair, Washington as a GIS technician.

Online Water Data Entry and Repository for Restoration and Monitoring Sites throughout Washington State

Karen Dvornich,

National Director, The *NatureMapping* Program
University of Washington
Washington Cooperative Fish and Wildlife Unit
Box 355020, Seattle, WA 98195-5020
(206) 616-2031
vicon@u.Washington.edu

Over 11,500 people are involved in monitoring water quality, macroinvertebrates and habitat restoration projects. *NatureMapping's* Water Module includes online data entry screens, a way for users to provide their level of expertise, and a user created website that allows others to view their data. Surface water management groups, schools, watershed groups all provide their data in a consistent format. This application brings together a wide variance in experience and knowledge levels among volunteers. This presentation will explain how data standards are maintained given this wide variability.

Biography:

Karen Dvornich is The NatureMapping Program co-founder, National Director, outreach coordinator of the Washington Cooperative Fish and Wildlife Research Unit, and former Washington Gap Analysis Project Assistant. Karen has B.S. degrees in Ethology and Zoology and 20 years of experience in information technology and telecommunications.

Keeping the data useable: Setting the Standards for Volunteer Data Collection

Jeffrey B. Trollinger

Wildlife Biologist and WildlifeMapping Coordinator
Virginia Department of Game and Inland Fisheries
4010 West Broad Street
Richmond, VA 23230-1104
(804) 367-8747
jtrollinger@dgif.state.va.us

The Virginia **WildlifeMapping** Program is now beginning its fifth year. Throughout this period all volunteers have been required to attend a one-day training event before submitting any data to the program. During this training, specific requirements are explained for consistency, coding, and exact specifications for what data to collect. Once received, the data are compared to existing known or likely county distributions to determine data reliability. Eventually GAP models will be utilized to determine validity to a more precise level. Likely data errors are traced back to each volunteer through their unique observer code and verified for accuracy or potential correction. Future developments for improving data standards will include an Internet-based data entry screen that will verify data based on observer location and associated county information for individual observers.

Biography:

Jeff Trollinger graduated from Virginia Tech with a bachelors degree in Wildlife Management in 1987. He began working for a research project at the University under contract with the Virginia Department of Game and Inland Fisheries in January of his senior year and this continued until 1990.

He received a second bachelors degree in 1995 in Human Resources Management from Bluefield College.

He was hired full-time by the Virginia Department of Game and Inland Fisheries in July, 1995 as a Research Specialist in the Fish and Wildlife Information Section. This resulted in a move from Blacksburg, Virginia to Richmond. (First time living out of the mountains.)

In 1999, he was promoted to Wildlife Biologist and Coordinator of the Department's statewide WildlifeMapping program.

Over the past 13 years he has become well versed in public information, watchable wildlife events, urban wildlife concerns, fish and wildlife databases, and working with wildlife volunteers.

Dublin Core-Based Metadata Standards for Resource Discovery: A U.S. Fish and Wildlife Service Work in Progress

Anne Post Roy
U.S. Fish and Wildlife Service
National Conservation Training Center, Conservation Library
Rt. 1, Box 166
Shepherdstown, WV 25443
304-876-7399
anne_roy@fws.gov

The U.S. Fish and Wildlife Service (FWS) will consider the adoption of Dublin Core (DC)-based descriptive metadata standards for their digital resources available online. These standards will be the basis for the description and administration of all FWS digital assets including images, publications, streaming video, map data, and archival digital objects. This will ultimately provide excellent Web resource discovery for the public and a good framework whereby information managers, Web publishers from all regions, and other outreach coordinators can post their files. These standards will aid in the establishment of a Service content management system to control duplication, highlight Service assets, and improve communication with our partners.

Metadata creation will also provide the means to administer the data files. Better administration will help relate versions to originals, link relevant files to one another using controlled vocabularies, and provide the means to archive historical electronic data over time.

A prototype digital library system using these DC-based field definitions is now under construction populated with FWS images from slide libraries in the Alaska regional office, Washington Office and NCTC Image Library. Version 2 may incorporate the metadata for those electronic publications which have already had descriptive cataloging created in another database as well as new data using the DC-based template. This template will be the interface used by registered "librarians" throughout the FWS for populating all Dublin Core data elements including proprietary fields that the FWS has added with qualifiers and some semantic changes.

This presentation will review the Dublin Core metadata element set of 15 descriptors or fields and how the FWS has customized DC. Dublin Core and its application within the library community with some reference to the migration or mapping with other existing library standards will be addressed. The importance of thesauri building and controlled subject headings will be discussed.

Biography:

Anne Post Roy is currently the chief librarian at the US Fish and Wildlife Service's National Conservation Training Center. She has built a library and information center from scratch beginning September 1997 to serve the training center. The library has evolved from a curriculum library for the students and instructional staff to a key portal for the many FWS field offices who need information and source material for their science-based management decisions. This is Anne's first federal government appointment. She has had a wide variety of professional experiences from work at a technical information center in Cambridge, MA, reference librarian at both public and academic libraries as well as work as a children's librarian. She received her BA from U. of Massachusetts-Amherst in 1978 and her Masters in Library and Information Science at Catholic University in 1982. She continues to pursue her professional education both formally and informally as well as spend time with her family.

What Makes a Library a Library and Why Does it Matter?

Lenora A. Oftedahl
StreamNet Librarian
Columbia River Inter-Tribal Fish Commission
729 NE Oregon St, Ste 190
Portland, OR 97232
(503) 736-3581
OFTL@critfc.org

Gretta Siegel
Science Librarian
Portland State University
PO Box 1151
Portland, OR 97207
(503) 725-4708
siegelg@pdx.edu

Any one can put a row of shelves up, throw some documents or books on it and call it a library, but is it really a library? Who cares? If you want to operate effectively in the world of information, data, and knowledge transfer, it matters a lot. This paper will address some of the macro standards that are used to determine an operation's value as a library, and some of the ramifications of meeting or not meeting those standards. In addition, we will discuss some of the micro-standards that are utilized in "real" libraries to ensure inter-operability in an increasingly information dependent world.

Biographies:

11 years experience implementing Library standards in many different library types, Lenora Oftedahl has concentrated on material description standards, cataloging and classifying documents. Currently, she is the StreamNet Librarian at the Columbia River Inter-Tribal Fish Commission.

Gretta Siegel got her Bachelor's degree in Chemistry from Humboldt State University, her Masters degree in Biochemistry and Biophysics from Oregon State University and an additional Masters degree in Information Science from Syracuse University. She has spent the past 16 years working in a variety specialized and academic libraries, holding a range of positions from cataloger to Library Director. Gretta's most recent job was at the Columbia River Inter-Tribal Fish Commission where she began by working on the bibliographic component to the StreamNet data management project. She was successful in developing the project to the point of creating the StreamNet Library to support northwest fishery management decision making. She has written several articles and made presentations on this project as well as on the collection and management of grey literature in general. She is currently works at Portland State University as their Science Librarian, Coordinator of Graduate Student Services, and Coordinator of Scholarly Communication Resources.

How Do You Catalog a Frog, a Matchbook Cover, and Other Information-rich Sources?

WORKSHOP

Lenora A. Oftedahl

StreamNet Librarian

Columbia River Inter-Tribal Fish Commission

729 NE Oregon St, Ste 190

Portland, OR 97232

(503) 736-3581

OFTL@critfc.org

Gretta Siegel

Science Librarian

Portland State University

PO Box 1151

Portland, OR 97207

(503) 725-4708

siegelg@pdx.edu

In the world of fish and wildlife management, there are many resources rich in useful information. Some are quite traditional, while others are not. Using hands-on examples, two librarians with extensive experience in cataloging a wide variety of fish and wildlife materials will guide you in creating useful data records that meet the best of citation standards. The objective of the session will be to increase the understanding and appreciation of citation standards and to give people the tools they need to create solid catalog (read: metadata) records for books, technical reports, electronic data, and very, very grey literature.

Biographies:

11 years experience implementing Library standards in many different library types, Lenora Oftedahl has concentrated on material description standards, cataloging and classifying documents. Currently, she is the StreamNet Librarian at the Columbia River Inter-Tribal Fish Commission.

Gretta Siegel got her Bachelor's degree in Chemistry from Humboldt State University, her Masters degree in Biochemistry and Biophysics from Oregon State University and an additional Masters degree in Information Science from Syracuse University. She has spent the past 16 years working in a variety specialized and academic libraries, holding a range of positions from cataloger to Library Director. Gretta's most recent job was at the Columbia River Inter-Tribal Fish Commission where she began by working on the bibliographic component to the StreamNet data management project. She was successful in developing the project to the point of creating the StreamNet Library to support northwest fishery management decision making. She has written several articles and made presentations on this project as well as on the collection and management of grey literature in general. She is currently works at Portland State University as their Science Librarian, Coordinator of Graduate Student Services, and Coordinator of Scholarly Communication Resources.

Concurrent Sessions:

Data Management and Delivery (Session I)

Bridgette Hagerty, Chesapeake Research Consortium

Carol Murray, National Marine Fisheries Service

Shelly Miller, VA Department of Game and Inland Fisheries

Karen Reay, VA Department of Game and Inland Fisheries

Dale Guenther, Regional Ecosystem Office, U.S. Forest Service

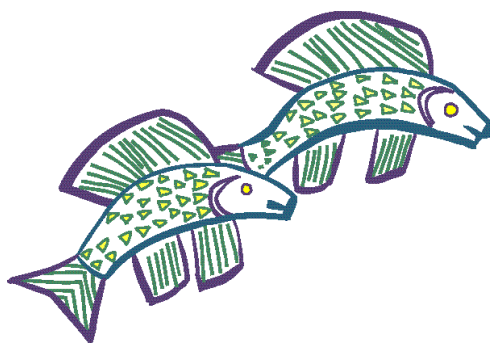
Kathleen Quindlen, VA Department of Game and Inland Fisheries

Amy Martin, VA Department of Game and Inland Fisheries

Jon Bowers, Oregon Department of Fish and Wildlife

Dick O'Connor, WA Department of Fish and Wildlife

Kirk Keller, MO Department of Conservation



Metadata Training Session

Sharon Shin, U.S. Geological Survey

Bruce Westcott, SMMS Metadata Consultant

The Chesapeake Information Management System (CIMS): Using a distributed data system to manage environmental data across political boundaries

Bridgette Hagerty

Information Management Subcommittee Staff
Chesapeake Research Consortium
Chesapeake Bay Program Office
410 Severn Ave. Suite 109
Annapolis, MD 21403
410-267-9845
bhagerty@chesapeakebay.net

Evaluating the environmental health of a broad geographic region customarily involves using databases from several organizations. A data system that contains a wide range of environmental data from various sources must be flexible to handle rapid changes in technology, the social and political climate for sharing and integrating data, and expectations of diverse users. Many organizations, including the Chesapeake Bay Program (CBP), have developed distributed data systems to effectively manage data across biogeopolitical boundaries. This Program, which encompasses several jurisdictions within the Chesapeake Bay watershed, has adopted some common solutions, as well as unique solutions suited to its particular needs associated with data management. CBP has a long history of creating and maintaining centralized electronic databases. However, due to rapid changes in technology, including the internet, CBP recognized the need for the development of the distributed Chesapeake Information Management System (CIMS). Through CIMS, partner agencies manage their own data, while following common CBP guidelines and policies. CIMS incorporates the use of data standards with innovative web-based tools to provide a flexible, sustainable approach to data management.

Biography:

Bridgette Hagerty is currently at the midpoint of a two-year fellowship position with the Chesapeake Research Consortium. As a CRC fellow, Bridgette staffs the Information Management Subcommittee of the EPA Chesapeake Bay Program in Annapolis, MD. She is involved with database design/management and web development, as well as education of CBP grant recipients and jurisdictions about the functionality of the Chesapeake Information Management System (CIMS).

West Coast Electronic Fish Ticket and Logbook System

Carol Murray
National Marine Fisheries Service
WASC-F/NWCX1
2725 Montlake Blvd. East
Seattle, WA 98112-2097
(206)860-3200
Carol.A.Murray@noaa.gov

New electronic fishery information system technology (EFCL)

Problem Statement

Most fishery dependent information, including information from fisher's logbooks and processors' fish tickets, is collected manually, often in different formats throughout the country. Fishermen asked the Northwest Fisheries Science Center to develop an electronic logbook to allow better use of data that fishermen are already required by state law to collect.

In addition, users wanted to be able to enter fish landing data electronically, make use of electronic technology for observers and port biologists, and use computers to avoid duplicate data entry. It was felt that better, more up-to-date information showing fishing activities collected in near-to-real time, could improve fisheries management and support better fishing practices.

The NWFSC received funding from the Innovative Technology Fund to complete EFCL development. The terms of the grant required a nationwide focus of a systems' product that could return the costs of development to the Fund.

Critical Factors

- 1• Fishery dependent data collections vary widely across the country, requiring development of a modular system that is adaptable to a variety of implementation approaches;
- 2• The system must have bank level security protocols and near-to-real time communication capabilities by cell phone and satellite to meet different needs in different regions;
- 3• Disk copies of logbook entries might serve in some regions; currently, enforcement requires paper copies of recent logbook entries and fish tickets to be kept onboard the vessel;
- 4• Pressure on stocks is reducing commercial opportunities for fishers, so the optimum software system would cost under \$1000;
- 5• A private Cooperative Research and Development Agreement (CRADA) would facilitate the private sector development of the onboard application – and prevent government from having to provide “help desk” services and application upgrades; and,
- 6• The States, Councils and Commissions play differing roles in different regions, but need to be an integral part of developing requirements for the system.

Status of Technology Development

Extensive user surveys of fishers, marketers, processors, scientists, NMFS personnel, state, Commission and Council members were conducted. A private applications' developer, under a CRADA, developed the onboard application – which will be given free to commercial trawl fishers who test the system on the west coast. The onboard application is expected to sell for less than \$500 and the contractor will modify it to meet differing requirements in different regions. An external private sector GSA contractor developed the web interface and the database, meeting Center design specifications.

The EFCL onboard application connects to a GPS to record the location and time of fishing events, such as a haul or tow. When the fish catch from that haul has been sorted, fishers enter the fish catch species and weights on a computer keyboard. When all of the hauls are

complete, the system downloads this information via a cell phone and modem to a central database. Since catch and landing data is traditionally confidential, a sophisticated security system has been built in.

Users will be able to access the central database via the world wide web to check their own data, though this part of the system cannot be officially implemented without legal changes (and can be disabled if these changes do not occur). The database and the web site will also provide fishers with maps of their own fishing locations, quota reports showing how much of a fisher's quota has already been landed, as well as an array of additional information.

The overall system is designed to mirror the existing paper reporting system, but to do it more quickly, accurately, cheaply and reliably. The most important data are likely to be catch per unit effort data, which can be used to support both fishery management decisions and fishing business decisions.

Minimizing costs to fishers was a critical design consideration. Since many skippers now have "on vessel" computers for electronic charting, GPS devices and cell phones, rather than develop new hardware requirements, the EFCL uses their components. The system will therefore cost less than a design based on custom hardware, and is modular to take advantage of technology advances. For example as wireless bandwidth increases, and costs decrease, fishers will be able to benefit from and contribute more electronic information, even from their boats.

Future Considerations

Extensive alpha testing is complete. Beta testing, using real participants during actual fishing and landings, is also complete. Independent testing and validation is complete on the web interface and the database. In other regions of the country, the parties that have responsibility for collecting logbook and fish ticket information, will be given copies of the programming. Some may need funding for implementation. These parties will then decide whether they want to use the system for data collection. Currently, there is broad enthusiasm inside and outside the NMFS for the project. The State of California has expressed interest in applying the fish ticket module of the EFCL to capture fish ticket data. The Observer Program for the West Coast Groundfish Fishery plans to use the observer module to capture observer information. A number of organizations, including the Department of Agriculture and the Coast Guard, have expressed interest in the field reporting architecture, and are considering the system for their own use.

Key Players:

Science Directorate (SD), NWFSC
Fishery Resource Analysis & Monitoring (FRAM) Division, NWFSC
ARIS Corporation
Midwater Trawlers Cooperative
Washington Department of Fish & Wildlife
Scientific Fisheries, Inc.
Fishermen's Marketing Association
Pacific Fisheries Management Council
Pacific States Marine Fisheries Council
Pacific Seafood Processors' Association
Coos Bay Trawlers Association
California Department of Fish & Game

Biography:

Carol Murray is the Strategic Planner for the Northwest Fisheries Science Center, NMFS. Over the last six years, in addition to her planning duties, she has filled in as the interim head of the Science Center's IT group and the Salmon Data Program. Prior to joining NMFS, she lived for ten years in Asia. Her professional expertise is in legal/economic/resource strategic problem solving. Prior successes include devising a strategy that resulted in over \$1 Billion being released for clean up of contaminated lands in Washington State.

The Development and Implementation of a Database and GIS Application for Anadromous Fish and Impediment Information... or Go Fish Go!

Shelly Miller and Karen Reay
Wildlife Diversity Division
Virginia Department of Game and Inland Fisheries
4010 West Broad Street
Richmond, VA 23230-1104
(804) 367-0909
smiller@dgif.state.va.us
kreay@dgif.state.va.us

Several agencies and organizations have expressed repeated interest in the development of a statewide impediments and anadromous fish use database and GIS. The Virginia Department of Game and Inland Fisheries has developed products over the past several years in an attempt to meet these needs. Our latest efforts involve the development of several user-specific datasets. These datasets have been designed to meet different application requirements including permitting, environmental review and compliance, fisheries management, and resource planning. Several different data sources were combined in the development of these datasets. Lack of data standards and inconsistencies in datasets complicated this combination. Various meetings with end-users and assessments of existing similar datasets assisted in decisions regarding data that would be used, how the data would be represented, and the format of the final products. The final products include static maps of impediments and stream reaches used by anadromous fish for migration, spawning, and/or nursery habitat, ArcView GIS shapefiles of the same, a MS Access database of the Impediments with some standard queries available, and a textual document describing the boundaries of the anadromous fish use reaches. These products will be distributed on CD, Internet, and paper, if necessary.

Biographies:

Shelly earned a Bachelor's degree in biology from the College of William and Mary in 1992 and a Master's degree from the University of Pittsburgh's Program in Ecology and Evolution in 1994. Shelly's professional experiences include 3 years with the West Virginia Dept of Natural Resources where she worked on projects primarily related to acid rain and acid mine drainage remediation and 2 years with The Nature Conservancy during which she assisted in the development of aquatic habitat classification, threats assessment, and conservation planning for several watersheds. Shelly currently works as an aquatic biologist with the Virginia Dept. of Game and Inland Fisheries' Wildlife Diversity Division. Shelly has been in this position for 2 years. Her duties include data management, GIS data development and analysis, and other activities related to the management of Virginia's underappreciated cold and slimy creatures.

Karen Reay has been employed by the Virginia Department of Game and Inland Fisheries as a Research Specialist, Sr. since 1995. Prior to employment at DGIF, Karen was employed as the Assistant Project Leader of the Fish and Wildlife Information Exchange (now Conservation Management Institute), at Virginia Tech. Karen received her BS in Biology in 1985 from Juniata College, Huntingdon, PA and her MS in Marine Science in 1990 from The Virginia Institute of Marine Science, College of William and Mary. She lives in Gloucester, VA with her husband, Willy and son, Jared.

Hydrography Framework Clearinghouse for the Pacific Northwest

Dale Guenther

Regional Ecosystem Office
US Forest Service
333 SW 1st Avenue
Portland, OR 97208
(503) 808-2188
dguenther@fs.fed.us

Through a collaborative effort with all federal, state and local agencies, this partnership has established a single hydrography clearinghouse and support structure. This structure includes data integration protocols, route/event creation and editing tools, core (required) data attributes, and roles and responsibilities for each partner.

The clearinghouse software suite was developed by ESRI and the Regional Ecosystem Office (REO), and based on Arc 8.1 and SDE software. Through the Internet, users first 'check out' or lock an area for update then 'checked in' updated hydrography. The system validates the data for accuracy and completeness. It is then posted to the clearinghouse and this update is available for viewing (ArcIMS) or downloading.

This effort in collaboration is a model for other regions of the country in order to implement framework data across agencies. For further information or to visit the clearinghouse visit www.reo.gov

Biography:

Dale Guenther is currently the GIS Administrator for the Regional Ecosystem Office, an interagency office, in Portland, Or. Previous experience includes Regional Forest Service GIS Coordinator in Portland, application developer, and timber beast. Education includes a BS in Forest Management, with a minor in business management.

Data, Standards, and the Scientific Collection Permitting Process in Virginia

Kathleen Quindlen and Amy Martin

Wildlife Diversity Division

Virginia Department of Game and Inland Fisheries

4010 West Broad Street

Richmond, VA 23230-1104

(804) 367-9717

kquindlen@dgif.state.va.us

amartin@dgif.state.va.us

The Virginia Department of Game and Inland Fisheries (VDGIF), as the regulatory authority over Virginia's wildlife species, issues permits for the collection of these species. According to the wildlife and fish laws in the Code of Virginia, a collection permit allows for collection of a determined number of "one or more designated species when the collection is shown to be an essential part of a specific research project." Collection for museums, educational programs, and propagation for "preservation purposes" are also permitted. One of the requirements of obtaining a collection permit is that the collectors agree to submit data annually in the format required by VDGIF.

In order to guarantee that these data are useful to VDGIF, and appropriate for use in VDGIF's online system of wildlife resource databases, Virginia Fish and Wildlife Information Service (VAFWIS), the data must include certain fields of information. Requiring that data be submitted in a specific format reduces the amount of time spent entering the data into VAFWIS and reduces error that may be introduced through manual keying of information. Therefore, data standards with regard to the data fields required and the format of data submissions are being instituted. Electronic submission format requirements will be phased in over several years to allow permittees to adjust to the more stringent standards.

The information gathered through the scientific collection permitting process is entered into the "Collections" database of the VAFWIS. VAFWIS is a web-based data reporting system that allows users to query many of VDGIF's databases, including "Collections", serving up the data as either textual reports or as map pictures displaying geo-referenced data in the form of points, polygons and lines. Different access security levels allow different types of VAFWIS users (public, government and private-sector subscribers, and VDGIF biologists) to view appropriate levels of information and allow for the protection of sensitive data about threatened and endangered species locations.

Biographies:

Kathy Quindlen is currently the manager of Fish and Wildlife Information Services and Geographic Information Systems for the Virginia Department of Game and Inland Fisheries (VDGIF). The Virginia Fish and Wildlife Information Service (VAFWIS) system of databases has been developed and maintained by VDGIF for the management and delivery of wildlife resource

and habitat data for the Commonwealth of Virginia. A large and varied user community, ranging from federal agencies to private consultants and industry, use VAFWIS to conduct geographic searches for threatened and endangered species occurrence and other pertinent wildlife resource information. Kathy's group manages diverse databases and geospatial data sets that are used for many other applications, including land acquisition, land management, law enforcement, and research. Kathy has been an active member of the Organization of Fish and Wildlife Managers since 1996, serving as Secretary from 1998-2000. Kathy lives in Richmond, Virginia, with her two children.

Amy Martin has been the Online Service Coordinator at the Virginia Department of Game and Inland Fisheries (VDGIF) since April, 2001. The Online Service Coordinator position requires that Amy oversee the everyday activities that affect or are affected by the Virginia Fish and Wildlife Information Service (VAFWIS). The VAFWIS is an online service that provides fish and wildlife information to biologists, consultants, land managers and the general public. Amy is currently finishing up research on her thesis in order to receive her Master's degree from Virginia Commonwealth University's (VCU) Center for Environmental Studies. Amy is interested in not only providing empirical data about Environmental Education, but also serving the communities by educating them on the health of their watershed and how they can take steps to help improve it. Amy entered the program at VCU having already obtained her Bachelor's degree in Wildlife Science from Virginia Polytechnic and State University (VA TECH) in 1996. Her studies at VA Tech were focused mainly on mammalogy and exotic species management. Amy worked for a number of years at a wild animal preserve in Virginia and has welcomed the opportunity, through VDGIF, to return to the study and management of Virginia's native wildlife species.

Applying a Consistent Definition to the Development Of Statewide Salmonid Distribution Data

Jon Bowers
GIS Manager
Oregon Dept. of Fish and Wildlife
2501 SW First Ave., PO Box 59
Portland, OR 97207
(503) 872-5255 ext. 5603
jon.k.bowers@state.or.us

The Oregon Department of Fish and Wildlife initially developed statewide salmon distribution data at a 1:100,000 scale between 1994 and 1996. When the data were collected, district biologists were instructed to identify spawning, rearing and migration "habitat" for each species of anadromous salmon. Each biologist was allowed to develop the distribution data for their area by applying their own definitions for the different habitat types. This approach resulted in the inconsistent delineation of salmon habitat between different fish biologists' districts.

This problem was not realized until the data had been compiled statewide. In response, ODFW developed standard definitions to describe each of the different habitat types. These definitions were then applied when the distribution was updated between 1999 and 2000. I will demonstrate how the lack of clear definitions for the seemingly simple terms of "spawning", "rearing" and "migration" resulted in data that was, well, a bit "fishy". I will also demonstrate how the implementation of these definitions led to more consistent, defensible and believable data representing the salmon distribution within the state of Oregon.

Biography:

Jon Bowers, GIS Analyst, Oregon Department of Fish and Wildlife
For the past 3 years, Jon has worked for ODFW as part of the regional StreamNet project. His focus has been on developing statewide salmonid distribution datasets and has also worked to develop fish passage and observation data. He has also managed the Oregon component of the 1:100,000 scale Pacific Northwest river reach files.

Previously, he was with the non-profit organization Interrain Pacific in Portland for 4 and a half years where he worked to develop the capacity of community based conservation organizations to use GIS as a decision support tool. Jon has a Bachelor of Science degree in Resource Sciences from the University of California at Davis.

Scrambling for Data Standards in the field of Habitat Restoration Projects

Richard J. (Dick) O'Connor

Fish Resource Data/Systems Manager
Fish Program, Science Division, Biological Data Systems Unit
Washington Department of Fish and Wildlife
(360) 902-2778
oconnrjo@dfw.wa.gov

As the pace of decline for several Pacific salmon stocks has increased, there has been an ever-increasing emphasis on taking action to slow or halt these declines. Habitat Restoration projects are a popular tool employed to counteract some of the deteriorating environmental conditions that contribute to stock decline.

Restoration projects can be expensive, and after the initial rush of project approvals, the need to monitor such projects for effectiveness quickly captures the attention of policy-makers. Commonly, funding the restoration activities themselves has taken initial precedence over support for the design and construction of effective monitoring tools. Citizens call out for money to be spent “on the ground”, not “in the office”. Those who are tasked to track projects, to compare efforts to similar work in other jurisdictions, or to evaluate overall success of activities are then hampered by the lack of standards applied to the data items collected, the measurement techniques applied, even the formats used to store project information.

In Washington State, we have encountered several hurdles to managing and using state-funded habitat restoration project information that stem from inadequate adoption and application of data standards. Examples I will share include problems with standardized location coding, standardized cost/participant tracking, and standardized treatment of single projects with multiple work sites. Solutions to our specific problems may involve retrofitting an existing system being operated by another agency. Despite this hurdle, we are starting to make positive progress toward our goal of standardized data to support objective project evaluations.

Biography:

Education:

Ripon College, Bachelor of Arts in Mathematics and Science; Secondary School Teaching Certification, 1975. University of Washington, Master of Science in Fisheries Population Dynamics, 1977.

Thesis: Ocean Growth, Mortality, and Maturity of Columbia River Fall Chinook Salmon

Current Employer and Responsibilities: 1977-present: Washington Department of Fish and Wildlife. Manage the Biological Data Systems (BDS) Unit of the Fish Program's Science Division. The purpose of this Unit is to develop the full range of computer-based strategic information systems and related analytical tools that are needed to successfully implement fish

harvest management, production, and applied research measures that will maximize long-term net fish resource benefits to the state of Washington.

Expertise: 1) Salmonid stock management techniques and issues; 2) Database design, construction and maintenance; 3) Computer program design, construction, and maintenance; 4) Computer hardware and software troubleshooting and repair; 5) Project management; 6) Staff supervision

Publications/Activities: *Data systems development.* 19 years experience assessing user needs, designing, constructing, testing, and deploying computer systems for professional fish managers in WDFW.

Database development: 24 years experience assessing user needs, designing, constructing, and maintaining datasets and database systems for professional fish managers in WDFW.

Region-wide data sharing projects: 19 years experience developing fish data exchange formats and common systems for West Coast states and British Columbia through the PMFC/PSMFC Committee on Anadromous Fish Marking and Tagging, the Pacific Salmon Commission (PSC) Data Sharing Committee's Work Group on Data Standards, and the Northwest Power Planning Council's CIS/StreamNet Project; appointed to PSC Data Sharing Committee (U.S. Section) in 1999.

Content syndication between state and federal fish and wildlife agency web sites: A proposal on the use of XML Resource Description Framework (RDF) files on agency web sites

Kirk Keller

Missouri Dept. of Conservation
2901 W. Truman Blvd.
Jefferson City, MO 65102
573-751-4115 ext. 3244

kellek@mail.conservations.state.mo.us

In the near future, web viewing habits will shift to the use of intelligent agents and portals which gather information from many web sites and present them to the user.

How can an agency make time-sensitive information available for publication on other web sites while, at the same time, ensuring that the content maintains its integrity? In other words, once you give a web site your list of fishing seasons, how can an agency be sure that those web sites will respond to future revisions of those seasons?

Agency web sites must adopt a content syndication model for the deployment of time-sensitive data. This would enable one web site to link directly to the information of another web site. Furthermore, changes in that information would be reflected on web sites syndicating this content. Such a framework would enable intelligent agents to gather content and maintain data integrity.

A basic framework for content syndication of web content already exists -- the Resource Description Framework (RDF) -- a particular use of XML.

This paper will discuss the basic framework of RDF will propose candidates for RDF grammars to be used for content syndication between agency web sites for hunting and fishing seasons, permits, and calendars of events.

Biography:

Kirk Keller is an Interactive Media Specialist for the Missouri Department of Conservation. He has developed applications and strategies for the department's Web site since 1996. The MDC Web site currently is host to over 11,000 pages of content and has over 2 million page views per month.

Kirk has written or edited several books on multimedia and web development and also currently is a member of the Missouri charter committee for the creation of a state e-government portal. His work focuses on integrating web development into existing media workflow as well as the development of strategies for syndication of content across government agencies and Web sites.

Metadata Training Workshop

Sharon S. Shin

NBII Implementation Coordinator / NBII Metadata Training Program Manager
US Geological Survey
Center for Biological Informatics
Denver, CO
303-202-4230 (v)
sharon_shin@usgs.gov

Bruce Westcott

SMMS Metadata Consultant
(802) 223-7074
bspacial@together.net

Who Should Attend :

Conference attendees with experience producing spatial metadata records, or those responsible for implementing a practical metadata development plan within their organizations.

What We'll Cover :

1. Implementation of the Biological and Shoreline profiles of the FGDC Metadata standard
2. Preparation for migration to ISO-standard metadata issues and opportunities,
3. Creation of a step-by-step workplan for creating metadata in your organization,.
4. Development in-house standards and practices necessary for high-value metadata within your organization.

Attendees might want to bring :

1. Samples of problematic metadata records (FGDC TXT or SGML format, on a diskette)
2. Samples of “boilerplate” language for problematic fields: quality statements, limitations of use, liability, etc.
3. Laptops with on-board diskette or CD drives; shareware and commercial software will be available for installation.

OFWIM 2001 Conference Banquet Speaker

National Biological Information Infrastructure (NBII): History, Goals, Structure, Direction, Applications

John “Jack” M. Hill, Ph.D., VP
NBII Coalition Chairman
Houston Advanced Research Center (HARC)

The National Biological Information Infrastructure (NBII) www.nbii.gov is a broad, collaborative program to provide increased access to data and information on the nation's biological resources. The development of the NBII grew out of a set of related policy statements and management recommendations that provided the foundation for this cooperative undertaking. The NBII program was created in 1993 based on the recommendation of a special panel convened by the National Research Council to examine critical national biological issues.

One of the key components of the next generation NBII-2 is a system of nodes that is being developed to ensure broad partnerships and information from all sectors of society. NBII nodes are of three types: regional, thematic, and infrastructure. Regional nodes have a geographic orientation and represent a regional approach to local issues, data collectors, and owners. Thematic nodes focus on a particular biological issue, such as avian (bird) conservation, providing the support and infrastructure to help address these issues. Such issues often cross multiple geographic areas. An infrastructure node is devoted to issues such as indexing and abstracting, information retrieval technologies, and more generally, knowledge integration, particularly information with a geospatial flavor (geographically referenced). The NBII program initiated development of 10 nodes in FY 2001, and is seeking funds to expand the number in appropriate functional areas. The node oriented NBII-2 makes it possible to integrate and synthesize many different databases, analyze information in new ways, and answer questions and present results that can be readily used by resource managers, policy makers, educators, and the public.

This presentation will also focus on some of the interesting initiatives that the initial NBII nodes have begun to conduct. Particular emphasis will include specific applications of biological data conducted by the Central Southwest/Gulf Coast Region Node (CSWGC) and the Southern Appalachian Information Node (SAIN). CSWGC applications will include urban biodiversity in the Houston region (forest and bayou inventories), Big Bend National Park and associated international and conservation implications, the environmental assessment of the NAFTA highway, etc. Partnership, and the sharing of data, information, and expertise between the NBII and the IAFWA is seen as a very important step in assuring that vital biological data are made available to the wide range of those that need it.

National Biological Information Infrastructure (NBII): History, Goals, Structure, Direction, Applications

Biography for Dr. Hill:

John “Jack” M. Hill

Dr. John “Jack” M. Hill is currently Vice President of the Environmental/ Information Systems Division of the Houston Advanced Research Center (HARC), Coalition Chairman for National Biological Information Infrastructure (NBII), and Director of the Central Southwest/Gulf Coast Node of the NBII. He holds a concurrent Adjunct Professor position in the Department of Geography at Texas A&M University. Dr. Hill has a BS degree (Biology) from Towson State University (Maryland), an M.S. (Biology) from the American University (Washington, D.C.), and Ph.D. (Biology) from Texas A&M University. Prior to HARC, he was an Associate Professor in the Civil Engineering Department at Louisiana State University (LSU) and Associate Director of the Remote Sensing and Image Processing Laboratory.

His primary expertise and research presently focuses on the integration and analysis of spatial data (e.g., satellite and aircraft imagery, airborne LIDAR terrain, maps, field information) in a computer information system, thereby helping commercial and government managers to visualize earth data in order to make informed decisions.

Dr. Hill has over 100 technical publications and has been funded by such agencies as the United Nation's Food and Agriculture Organization (UN-FAO), National Science Foundation (NSF), Agency for International Development (AID), U.S. Army Corps of Engineers (USA-COE), the U.S. Geological Survey (USGS), National Aeronautics and Space Administration (NASA), the U.S. Environmental Protection Agency (EPA), the Federal Emergency Management Agency (FEMA), the Asian Development Bank (ADB), and the Texas Department of Transportation (TxDOT). He was also Chief Scientist aboard Jacques Cousteau's RV/Calypso. Environmental applications oriented projects have been successfully conducted by Dr. Hill in such countries as Bangladesh, Brazil, China, Indonesia, Mexico, the Philippines, Thailand, and Venezuela.

Data Management and Delivery

(Session II)

Sharon Shin, U.S. Geological Survey, Biological Resources Division - CBI

Bruce Schmidt, StreamNet Pacific States Marine Fisheries Commission

Michael Banach, StreamNet Pacific States Marine Fisheries Commission

Bruce Schmidt, StreamNet Pacific States Marine Fisheries Commission

Shaun P. McKinney, U.S. Forest Service



Closing Comments and Wrap-up

"National Biological Information Infrastructure Activities: Biological Data Profile and NBII Thematic and Regional Node activities."

Sharon S. Shin

NBII Implementation Coordinator / NBII Metadata Training Program Manager
US Geological Survey
Center for Biological Informatics
Denver, CO
303-202-4230 (v)
sharon_shin@usgs.gov

What is a "Profile" According to the Federal Geographic Data Committee, "Profile" is a subset of the FGDS's base standard that describes the standard's application to a specific, here biologic, user community and may have extended elements. So now, what is a Node?- NBII Nodes are interconnected information entry points that provide a vast user community with rapid access to information on the nation's biological resources. The Nodes foundations consists of broad partnerships from all sectors of society. Why are these topics presented together? These are two of the project areas NBII can assist and or lead to partnerships with biological information managers. This presentation will discuss the Biological Data Profile as a prelude to the half-day metadata workshop presented on Wednesday afternoon. Discussion will focus on the data types ameanable to the Biological Data Profile. NBII Thematic and Regional Node activities presentation focuses on node thematic or regional issues, node partners, and recent developments.

Biography:

Sharon Shin. NBII National Metadata Program Manager and NBII Implementation Coordinator. Sharon manages all NBII metadata aspects and coordinates NBII clearinghouse activities. Sharon developed the NBII national metadata training program through the cooperation of and partnership with data and natural resource agencies and departments across the country. Most recently, Sharon is collaborating with NOAA's National Geophysical Data Center to create web-base metadata training materials. Sharon is stationed at the Center for Biological Informatics in Denver, Colorado.

Use of region-wide data exchange formats to organize dissimilar data

Bruce Schmidt

Pacific States Marine Fisheries Commission (StreamNet)
45 SE 82nd Drive, Suite 100
Gladstone, OR 97027-2522
(503) 650-5400
bruce_schmidt@psmfc.org

The StreamNet Project is a cooperative effort among the tribes, state and federal fishery management agencies and regional organizations in the Columbia River Basin that collects, standardizes and disseminates a variety of widely used fish related data. It acquires a suite of specific data types from the management agencies in the basin and is faced with providing consistent data for use across all jurisdictional boundaries. Challenges to meeting the project mission include differing mandates between agencies, multiple methodologies employed in the field, inconsistent data definitions and formats, different internal data management systems, and different purposes for collecting the information initially. The challenge of providing data in a consistent format region wide was met by developing a Data Exchange Format (DEF) that was adopted by project participants within the data developing agencies. The DEF defines the contents and formats of the core data that will be included in (or 'exchanged' to) a single regional database. In this way, similar types of data are provided in a standardized format with agreed upon components, regardless of the data standards and definitions originally used when the data were collected. This allows for regional distribution of consistent data sets without forcing alteration of agency data collection programs.

Biography:

Bruce is the Program Manager for the StreamNet regional data management project. He brings the perspective of a fisheries biologist to the project, with an emphasis on serving the needs of the data user, not just meeting the needs of data managers. Bruce has a BS in Fishery Management from Utah State University and an MS in Fish and Wildlife Science from South Dakota State, which included Fortran programming for managing large amounts of angler use data. He comes to the project from the Oregon Department of Fish and Wildlife, where he served as Fish Research and Development Program Director and Science and Technology Program Director. Previous experience included Research Project Leader, Fish Division Planner and Chief of Fisheries for the Utah Division of Wildlife Resources.

Long term fisheries monitoring using standardized data sets:

How well is it working?

Michael Banach

StreamNet Fisheries Biologist
Pacific States Marine Fisheries Commission
45 S.E. 82nd Drive, Suite 100
Gladstone, OR 97027-5426
503-650-5400 x131
mike_banach@psmfc.org

The purpose of compiling a standardized database is to enable analyses that are otherwise not possible. Such analyses require not only standard database structures and coding, but also field methodologies amenable to such analyses, and accurate data entry and transmittal. The StreamNet database is a compilation of fisheries management data sets from state, federal, and tribal agencies in the Pacific Northwest. I used the StreamNet database to examine long-term fish population index monitoring data available in this region and to characterize the ability of these data to answer geographic and time-series questions. Limitations were encountered due to short time series, dissimilar data types among regions, inconsistent field methodologies, and data entry problems. The suitability of the database to answer complex time-series and spatial questions is mixed, but close to the best possible given the available data sources.

Biography:

Mike is the Regional Fisheries Biologist for StreamNet, which is an information system that covers many types of fisheries management data in the Pacific Northwest. Mike is employed by the Pacific States Marine Fisheries Commission. His main role is ensuring StreamNet data are consistent and usable. He is also StreamNet's main contact when users need assistance. Mike has a B.S. in Zoology and Environmental Biology from Eastern Illinois University, and an M.S. in Fisheries Management from Iowa State University. He has worked in the fisheries field since 1984 for universities and for state, federal, and tribal agencies in Iowa, Virginia, Idaho, and Oregon.

Obstacles to standardization of field sampling methodology Or: Why is it so hard to get everyone to do it the same way?

Bruce Schmidt

Pacific States Marine Fisheries Commission (StreamNet)
45 SE 82nd Drive, Suite 100
Gladstone, OR 97027-2522
(503) 650-5400
bruce_schmidt@psmfc.org

From a data management perspective, managing data at any scale above the individual sample site level would be made much easier if all field sampling were conducted using standard methodologies. However, there are multiple reasons why standardization of field methods is difficult and may never be fully achievable. There are both legitimate and illegitimate reasons for this. Legitimate causes for a lack of method standardization include varying conditions that affect the suitability or effectiveness of different methods, different scales of interest, different purposes or objectives for sampling, different levels of detail or statistical rigor required, different missions or authority of agencies, budget limitations, and others. Illegitimate reasons include blind adherence to familiar, easy or outmoded methods, the NIH syndrome, petty personal disagreements on the ideal method, or 'ownership' of a personally developed technique. If complete standardization is not possible, data managers are left with only a few options: standardize to the degree possible within types of surveys; develop data exchange standards that are adopted over multiple jurisdictions; focus on utilizing calculated estimates that can be more readily standardized than original raw data; or live with the chaos of uncertain data quality, inconsistent data definitions and formats, and limited ability to make inferences from data originally collected for other purposes.

Biography:

Bruce is the Program Manager for the StreamNet regional data management project. He brings the perspective of a fisheries biologist to the project, with an emphasis on serving the needs of the data user, not just meeting the needs of data managers. Bruce has a BS in Fishery Management from Utah State University and an MS in Fish and Wildlife Science from South Dakota State, which included Fortran programming for managing large amounts of angler use data. He comes to the project from the Oregon Department of Fish and Wildlife, where he served as Fish Research and Development Program Director and Science and Technology Program Director. Previous experience included Research Project Leader, Fish Division Planner and Chief of Fisheries for the Utah Division of Wildlife Resources.

Establishing and Implementing Aquatic Standards in the U.S. Forest Service; Protocols, Attributes, Hydrography and Applications

Shaun McKinney
NRIS Water Team
U.S. Forest Service
4077 Research Way
Corvallis, OR 97333
541-750-7188
smkinney@fs.fed.us

The U.S. Forest Service is in the process of establishing national protocols on aquatic habitat, classification and biotic sampling. This work is coupled with recent agency standards on hydrography and GIS layers. These elements are integrated in the corporate aquatic database application NRIS Water.

The Forest Service has employed a 3-tiered approach to establishing and implementing aquatic standards.

- 1) A corporate database was established and built in partnership with field specialists that included the identification of core attribute data;
- 2) Core hydrography layers (NHD) were identified and made available at multiple scales to all units;
- 3) Agency level protocols were derived and integrated into the corporate computer application.

NRIS Water provides aquatic specialists across the country a standard database application to store and analyze their information. It is linked to a spatial model that allows user friendly “on the fly” event creation to display this information. At present the application supports four business areas; 1) Aquatic Inventory, 2) Aquatic Biota, 3) Watershed Improvement Tracking and 4) Water Rights.

Implementing these standards across the country has untold benefits. The challenges to completion are technical as well as cultural. Utilizing standard organizational infrastructure as well as budgetary processes will insure full implementation. Finally a well built computer application coupled with interagency spatial data and standard protocols will ensure success.

Biography not provided

OFWIM 2001 Data Standards from A to Z

POSTER Session

*Carter Stein, Pacific States Marine Fisheries Commission
Dave Marvin, Pacific States Marine Fisheries Commission*

*Art Smith, SD Department of Game, Fish & Parks
Larry Gigliotti, SD Department of Game, Fish & Park*

*Bob Markve, Black Hills Special Services Cooperative
Eric Rudrud, St. Cloud State University
Joe Ferrara, Minot State University*

*Robin Carlson, Pacific States Marine Fisheries Commission
Stan Allen, Pacific States Marine Fisheries Commission*

*Elizabeth Martín, U.S. Geological Survey, NBII Program
Bruce G. Peterjohn, USGS Patuxent Wildlife Research Center
Mark D. Koneff, U.S. Fish and Wildlife Service*

Kevin L. Sallee, Ecological Software Solutions

Trinna Innes, Southern Interior Forest Extension & Research Partnership

Daniel Vichitbandha, Kentucky Dept. of Fish and Wildlife Resources



The Columbia Basin PIT Tag Information Systems A Real-life, Real-time, Regional Fisheries Research and Monitoring Success Story

Carter Stein, PTAGIS Program Manager
Dave Marvin, PTAGIS Systems Analyst*
Pacific States Marine Fisheries Commission
45 SE 82nd Drive, Suite 100
Gladstone, OR 97027

PIT (Passive Integrated Transponder) tags have been used since 1987 to monitor the movement and behavior of anadromous salmonids in the Pacific Northwest. The migratory patterns of these fish are complex and extensive; they cross many geographic and political boundaries as they migrate to and from their natal streams in the Columbia River Basin. Implanted into juvenile salmon (*Oncorhynchus spp.*) and steelhead (*O. mykiss*) before or during their seaward migration, PIT tags may be detected multiple times, at different locations and by various research or natural resource agencies, in the river system and/or ocean, and even subsequent to avian predation. Ten years ago, these various mark/recapture data were generally stored, managed, and often available to only the agency collecting the data. Since 1992, the Columbia Basin PIT Tag Information Systems (PTAGIS) has provided a centralized location for the submittal and correlated retrieval of all PIT tag mark and recapture data for anadromous salmonid stocks in the Columbia Basin. In the 2000 calendar year, PTAGIS processed over 1.25 million PIT tag marking records for salmon and steelhead, and over 500,000 unique passive detections of those tags at six interrogation sites downstream. Release, recapture, and especially automated passive interrogation data from a three-state area are routinely collected, incorporated, and publicly accessible through PTAGIS within hours. The migratory status of salmon and steelhead stocks, both juvenile and adult, has a dramatic impact on the coordinated operation of the Columbia Basin hydropower system. This near-realtime access of PIT tag data through a centralized repository is vital to the ability of hydro-system managers and resource agencies to balance the often conflicting constraints on salmon passage, flood control, and power generation. As the PTAGIS network has evolved and expanded, so too has its capabilities. To gauge the efficacy of fish transportation efforts in the Basin, for example, individual juvenile PIT-tagged fish can be routed to or away from the transportation vessels, based on their previous mark and/or recapture histories. Transport Benefit Ratios (TBRs) are calculated based on the passive detection and identification of those individuals, two or three years later, as returning adults. This type of "separation-by-code" activity, implemented through PTAGIS, allows a scope and scale of sampling and research not otherwise available to Columbia Basin resource management agencies.

Biography:

Dave Marvin has been a salmon biologist, of sorts, for a quarter century. He first applied himself to the (informal) study of harvest issues, roaming the high seas of the Oregon Coast in his troller for six years, trying to maximize and sustain his yield of kings and silvers. He has monitored the passage behavior and movement of salmon and steelhead through the rivers of the Columbia River Basin since 1985, first as a field biologist and then as the Information Manager for a regional resource management agency. In 1998, he joined the PTAGIS project at the Pacific States Marine Fisheries Commission, where he now spends most days trying to stick round fish into square database fields. After visiting many of the state's fine institutions of higher education, Dave finally left Oregon State University with a BS in Marine Biology.

Development and analysis of an electronic response system for harvest surveys

Art Smith

Game Harvest Surveys Coordinator
SD Department of Game, Fish & Parks
523 E. Capitol Ave
Pierre, SD 57501
(605) 773-4195
(605) 773-6245 - fax
Arthur.Smith@state.sd.us

Larry Gigliotti

Human Dimensions Specialist
SD Department of Game, Fish & Parks
523 E. Capitol Ave
Pierre, SD 57501
(605) 773-4231
(605) 773-6245 - fax
Larry.Gigliotti@state.sd.us

To develop precise, accurate harvest survey estimates requires obtaining pre-determined response proportions from the sample population. In South Dakota, harvest surveys are designed to produce accurate estimates by acquiring response rates of 90%. To accomplish this, a survey technique utilizing 3-4 sets of first-class mailings to survey recipients is employed. Business reply postage is included on each survey card to increase the survey's return probability. This technique is highly successful in obtaining the required response level, but requires a large amount of postage expenditures, not only for the initial mailings, but more so for the business reply postage. As the proportion of homes with computers and internet access steadily increase, providing survey recipients the ability to respond through the internet could replace much of the business reply usage.

This paper presents the outline of a web-based response system which could allow for quicker response times by the survey recipients and decreases in postage and encoding costs. This technique would be applicable to surveys where the potential respondents are known in advance. This paper introduces the techniques which will be used to analyze the pilot study, as well as some potential biases which may accompany this technique.

Transcribing and Compiling Accurate Data

Bob Markve

Black Hills Special Services Coop.
P.O. Box 218
Sturgis, SD 57885
(605) 347-4467

Eric Rudrud

Dept. of Leadership
St. Cloud State University
720 Fourth Ave So
St. Cloud, MN 56301
(320) 255-4155

Joe Ferrara

NDCPD
Minot State University
500 University Ave W
Minot, ND 58701
(800) 233-1737

Collecting, transcribing, and entering field and survey data is a time consuming task, often completed on an irregular or as needed basis. Major obstacles associated with data entry and compilation include:

- the accuracy of data entry is often unknown or suspect
- data often sits collecting dust, rather than be used
- the time crunch to enter data interferes with day to day operations
- data may be compiled in formats that are not user friendly

Dakota Data Services is a non-profit agency provides data transcription services to businesses and agencies. Transcription services include text and numeric data entry, data tabulation and formatting, exporting of data files, statistical analysis, and data presentation.

Dakota Data Services utilizes adaptive computer software that allows individuals with disabilities to enter data from remote locations, i.e. Hot Springs and Sturgis, S.D. Individuals dual enter survey data (two different individuals enter each survey or data form). Computer software checks for accuracy of data entry. If two individual data records agree, the data is entered. If there is a disagreement, the data record goes to quality control for final entry. All data is then uploaded and stored on a secure server. Data is then entered in either Access data-base, Excel Spreadsheet, and/or other data base format. Data can be compiled with a statistical analysis and/or formatted for presentation as charts, graphs, and/or text.

Businesses access their data via a secure web site where the business logs in and downloads data or Dakota Data sends the data file to the business via email. Dakota Data Services provides accurate data transcription services at competitive prices, fast turn around time, secure Internet connectivity for your data, and confidentiality. Customers include: Amoco Television Network, RedHouse Records, Brutger Enterprises, Square D Corporation, Central Minnesota Workforce Center, S.D. Governor's Council on Developmental Disabilities, and North Dakota Governor's Office.

California Habitat Restoration Project Database

Robin Carlson

Pacific States Marine Fisheries Commission
c/o California Department of Fish and Game
1807 13th Street #201
Sacramento, CA 95814
(916) 324-8298 phone
rcarlson@dfg.ca.gov

Stan Allen

Pacific States Marine Fisheries Commission
45 S.E. 82nd Drive, Suite 100
Gladstone, OR 97027-2522
(503) 650-5400 phone
stan_allen@psmfc.org

The California Habitat Restoration Project Database (CHRPD) was created to capture and maintain data for habitat restoration projects in California that benefit anadromous fish. The database is a cooperative effort between the Pacific States Marine Fisheries Commission and the California Department of Fish and Game (CDFG), with funding from the National Marine Fisheries Service. With its California-wide interagency scope, the database presents a unique opportunity to summarize and study restoration efforts across the state. Furthermore, because each restoration project in the database is georeferenced, the data may also be analyzed geographically, enabling evaluation of past restoration efforts and planning of future work.

An important emphasis of this project is to ensure that the data are entered and stored in the database in such a way as to make them compatible with as many other fisheries data programs as possible. Using the StreamNet (Northwest Aquatic Information Network) Data Exchange Format as a basis for the database provides one means of maintaining continuity with other data programs. In addition, project locations are georeferenced using a standard set of routed 1:100K California hydrography, enabling comparisons and joint analyses of CHRPD data and other data sets referenced to the same hydrography.

Access to Bird Population Data through Web Mapping

Elizabeth Martín

U.S. Geological Survey
NBII Program
12201 Sunrise Valley Dr., MS 302
Reston, VA 20192
Tel. (703) 648-4337
E-mail: elizabeth_martin@usgs.gov

Bruce G. Peterjohn

USGS Patuxent Wildlife Research Center
Monitoring Program
12100 Beech Forest Road, Room 227
Laurel, MD 20708-4038
Tel. (301) 497-5841
E-mail: bruce_peterjohn@usgs.gov

Mark D. Koneff

U.S. Fish and Wildlife Service
Division of Bird Habitat Conservation
11510 American Holly Drive, Room 301E
Laurel, MD 20708-4017
Tel. (301) 497-5648
E-mail: mark_koneff@fws.gov

Access to bird population data is needed for effective planning and evaluation of bird conservation activities. To address this fundamental need, the National Biological Information Infrastructure (NBII), the U.S. Geological Survey's Patuxent Wildlife Research Center, and the U.S. Fish and Wildlife Service are working together to develop the NBII Bird Conservation Node, a web-based information system that facilitates access to bird population and habitat data used in bird management and conservation. Initial development of the node focuses on creation of a prototype mapping application that provides interactive access to data from the North American Breeding Bird Survey, the Colonial Waterbird Survey, the Breeding Waterfowl Population and Habitat Survey, and the Atlantic Flyway Mid-winter Waterfowl Survey. This mapping application, based on ArcIMS technology, serves as a vehicle for visualization of each survey's data collection locations at the geographic scale selected by the user. By linking spatial information for each survey with its associated database, the system allows the user to retrieve raw data at the geographic scale that meets the user's specific needs. This web-based mapping application is an example of a technology that is increasingly becoming the standard for delivery of data and information to the wildlife management community.

Setting standards for the “do’s and don’ts” of software interface design

Kevin L. Sallee

Ecological Software Solutions

3154 53rd Street

Sacramento CA 95820

(916) 456-5617

ess.mail@ecostats.com

Much of the software in the wildlife sciences is destined for a small user group, and can not be created commercially. Instead, individuals, usually in government or university institutions, create software out of a direct need for such a product. This type of non-commercial development is essential to provide software that would otherwise not exist. However, much of this software is created by ecologists who have limited or no training in software or graphical design, or by programmers who have little or no experience with ecology. This often leads to cumbersome and complex user interfaces that are easily understandable only to the software designer. The result is good software often does not penetrate the wildlife community as well as it should. It is, therefore, essential in creating useable software to understand a minimum set of standard software interface protocols, and to communicate with the intended user group to appreciate their limitations and needs.

THE NATURAL RESOURCES INFORMATION NETWORK

An initiative of the Southern Interior Forest Extension and Research Partnership and British Columbia's natural resource communities

Trinna Innes

Natural Resources Information Specialist
Southern Interior Forest Extension & Research Partnership
478 St. Paul Street
Kamloops, BC, Canada V2C 2J6
250-371-3955
trina.innes@siferp.org

The Southern Interior Forest Extension and Research Partnership (SIFERP), is a unique, non-profit society with over 40 member organizations. We are dedicated to promoting - through extension and research - healthy and sustainable ecosystems throughout the interior of British Columbia, Canada.

In consultation with a wide variety of organizations and consulting support from private industry, SIFERP is facilitating the development of the Natural Resources Information Network (NRIN).² The vision for NRIN is:

To be a provincially-recognized network of organizations that cooperate to provide a comprehensive online source of information on natural resources and their management in support of effective planning, research and management decision-making in British Columbia.

NRIN provides the people of British Columbia a comprehensive searchable database of provincial organizations, events, publications (documents and data sets) and bulletins relating to natural resources and their management.

Via an oral presentation or poster submission, SIFERP would be pleased to explain how NRIN links many disparate information sources together for common search and discovery. We would outline how the FGDC metadata standard is used in our master catalogue and on online data entry tool. We would also present how SIFERP delivers extension services to assist each participating organization in making local decisions about suitable metadata frameworks (e.g., FGDC, GILS and Dublin Core) and discuss how that information is linked to NRIN—a true “one-stop-shop”.

² Additional information on NRIN may be obtained at: <http://www.siferp.org/nrin>

Moving Data through the Kentucky Fish and Wildlife Information System (KFWIS) Model

Daniel Vichitbandha

Kentucky Dept. of Fish and Wildlife Resources
#1 Game Farm Rd.
Frankfort, KY 40601
502-564-7109 x 476

Daniel.vichitbandha@mail.state.ky.us

The Kentucky Fish and Wildlife Information System (KFWIS) database provides storage and access to information on distribution of species in Kentucky. This poster presentation describes data flow and structure of KFWIS database. Kentucky Dept. of Fish and Wildlife Resources (KDFWR) began focused efforts to develop species distribution data in the late 1980's. Through time, data resided in at least 4 different software programs. SQL Server is currently used to store data format a wide variety of sources including university researchers, private consultants, and agency biologists. At present, the KFWIS database grows daily as KDFWR biologists enter species observation using a combination of hand-held Global Positioning System (GPS) and the Word Wide Web. The KFWIS database requires the ability to accommodate data from various sources with differing structure.

“Data Standards from A – Z”

***Organization of Fish and
Wildlife Information Managers***

Portland, OR



***For more information about OFWIM
and to get an electronic copy of these Proceedings go to:***

<http://www.ofwim.org>